Building a Collaborative Biomedical Network

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Matthew Holt

Thank you Ken. That is just a totally embarrassing introduction because there's no way I can hope to live up to that. The good news is that Ken did actually managed to steal most of the first half of my talk. So, I can quickly wrap it up. Thank you very much for making it up here and getting up on the third day of the conference. As a guy who runs conferences, you always dread—who's the poor sucker you're going to put up on that third morning. If you came here looking for the world famous surgeon who's got the patient movement going and is able to recruit people in the clinical trial without partnership with Avon—that was yesterday—that was Susan Love. If you think I'm the multi-billionaire who sold two drug companies and is now going to spend all my time on the money and effort reforming the healthcare system, sorry that was Monday. If you wanted the English guy that is going to talk to you about something that may or may not exist, yeah, well hang out in the room for a little bit. I do warn you though that I am best known as a blogger. This is a chart from an august organization I know well called the British Broadcasting Company. As you can probably tell I have a slightly strange American Accent. I am a Texan but I spend a lot of time in England. Okay. I'm lying about that part. This is a question about which media channels do people trust. You may notice that internet blogs only got trusted by a quarter of the people. So, now before you all leave the room and say what the hell is this guy talking about and why should I pay him any attention. Maybe worth noticing that we're slightly less distrusted than your friends, your families and your colleagues.

[Laughter]

All right, so I'm going to try to have a little fun today. I am probably the world's worst time—I have a fancy new Android phone and I will look at the time occasionally. I've cleverly with the computer blocked the thing which tells me how much time I've got left. Somebody will wave at me, I'm sure when I'm running out of time. We'll probably not get through any of my agenda, but that's all right. I would love it if in the middle of my speech you're appalled, disgusted, and want to stand up and start a conversation. I may not have a formal Q&A, but those mikes are there, stand up. I love arguing, shouting, haranguing. People sometimes throw stuff, but that's okay. I can duck.

George Bush when the guy at Iraq threw the shoes at him, and I can do that, too. All right, so I'm going to start and mostly talk about Health 2.0. I'm going to whiz through some Web 2.0 stuff just to sort of ground us. You guys mostly probably know a lot of this stuff and then I'm going to do something that's a little bit unusual which is go on a tour of several interesting and useful Web 2.0 sites. It's even more exciting because I brought my fancy net book down here and when we

plugged it in it decided that none of the resolution worked and I had to reload them all and some of them don't work in explorer. Interesting. Let's jump through this. I'm going to talk most about Health 2.0 and talk about some of the advances that consumers are making. It does also touch providers. It does touch researchers. I'm not going to focus too much today but I can answer some Q&A and talk a little about what's coming next. The shifts that I'm talking about I'm trying desperately to catch up in the present and talk about what's going on in the future. Then towards the end I'm going to shift gears and talk about some of the big pictures talk a bit about the universe—maybe not the whole universe—some little bits of it I try to understand and really look at the whole healthcare system because I'm trying every time when I talk to link back what we're discussing to the overall healthcare system, because in the end, all the technology, all the search, all the great stuff that you guys do, that's it's wonderful, but in the end it's all about treating patients and figuring out if we can have a healthcare system that can actually work for most people and at the moment, we don't.

All right. So I'm going to start off and what the hell is web 2.0. You've probably seen a few charts like this. You've probably seen this particular taxonomy and you've probably heard a few of these words wandering around the internet starting around 2003 or 2004. Tim O'Reilly who Ken already mentioned coined the term and there was this overall ecosystem that started developing, around about 2003 or 2004. Some of these names you're probably pretty familiar with, the order of this one is a bit wrong, an attempt at estimated values, the values are clearly wrong now. For example let's go and take a look at whoops—I'm hoping to find my there we go. This is my—this is one of my old roommates, Scott Summit—he's very impressed with himself because he was on the front page of the New York Times, but I can tell all about him on Facebook and I've thought this is particularly interesting. Facebook and what—I've lost it. Sorry. Somebody stop me when you see it. There it is. Does anybody recognize what this is? This is called a newspaper.

[Laughter]

And actually, my friend, Scott, his company was mentioned here. He has a really cool thing for printing, because I know and like him. Facebook has given us the ability to communicate with a lot of different people and so I thought it would be a useful idea to show how prevalent this is. How many of you were on Facebook back in 2004? 2004? You were all on Facebook—unlikely unless you were actually a Harvard student. You're going to tell me now—Harvard students here? It didn't get opened up until 2007 for most people. How many of you—talking about some of the other healthcare sites. How many of you were saw YouTube videos back in 2003? You guys are good. It wasn't founded until 2005. So think about the world, right. 500 million people on Facebook. YouTube is a huge search engine and what is that telling us this stuff is very—when caBIG® started none of this stuff really was on the public consciousness. Some of it didn't even exist. So all right, let's talk a little bit about—if I remember how to get to let's talk about those principles of Web 2.0. Just giving you some examples of all this. Here's this shift from services to from packaged services. You can still use iPhoto on your Mac. My colleague [inaudible] is a Mac aficionado. I don't like them so much, but you can still use those but now more and more people are sharing

information online. Here's Flickr. By the way, the Queen, as in my Queen, the royal family of England. She has her own account on Flickr and every morning she's uploading stuff. You don't believe me do you. She does have it. Go. Go. British monarchy. You've got to check it out on Flickr. Data sources that get rich as more people use them. If you think about the concept here we've gone from a world of expert. The [inaudible] guide, this authoritative viewer goes to a restaurant to where everybody can yelp and rate restaurants and that's a very powerful vehicle the resource of the crowd. Similar kind of thing in how we're thinking about this. I think this is very important for how anybody building software is trusting the concept of your users as your co-developers. We use at [inaudible] to send out e-mail spam to get people to come to our conferences and mail chip has a very interesting way of figuring out what they do next. They have a wish list and when you say I want this particular feature, it bubbles up to the top of this wish list and they really are trusting their users and their co developers similarly you know about Wikipedia and how that's replaced encyclopedia Britannia. There's some evidence that in many areas it's actually not only a lot broader, but in some cases possibly deeper, just by having—not a huge number, around 25,000 dedicated hard core Wikipedia authors and editors and millions more filling in around the blanks. Who has edited a Wikipedia page? Your guys are pretty well advanced. A group like you.

So, the next question is I want to raise the concept of the long tail. Does that—the word is probably familiar. Does everyone know what it means? Yes. I would ask for an explanation. No one wants to stand up to the mike and—it's not about monkeys. Believe it or not. It's a—so the concept here is you've got a long distribution of anything. Now the classic case that Chris Anderson used is amazon.com which essentially didn't have to stock the hit books the ones that would be in Barnes and Noble that would take up all the shelf space, but actually because it could essentially have a limitless catalog could get into that yellow part the long tail and what it's saying is there's a lot of activity on the long tail and in fact somewhere between 20-30% of the volume on any of these online retailers is down in that long tail, these are millions and millions of hundreds of thousands and millions of books or tracks or whatever on a music station that only sell a few copies, but if you add them all up there's quite a volume there. And it seems to me that that's a pretty similar analogy for the way that cancer works and the way that medical research works and the way disease happens, the way disease is tracked and understood. I think you'll find a lot of activity in the healthcare system, more and more as we figure out is not in the head of the tail—not in diseases like diabetes or asthma, things that we understand relatively well but in more and more people with more conditions that don't quite fit and are ending up in that long tail. And in fact—and I'm the guy in the room that knows the least about science, so you couldn't quote me about this, but my understanding is that diabetes in fact is actually made up of lots and lots of little diseases not one big disease and that we're going to find more and more of the world is down in this long tail. What that means in reality is that we're now doing self-service, customer self-service is prevalent in the world whereas you're going pas the physical bookstore. Amazon.com is the best example of this but in fact we're going to be moving onto that and the more and more you get into virtual goods rather than physical goods, the easier it is to have these limitless catalogs.

A couple of other things, we did mention—Ken mentioned this we're also living in a world which there isn't such a thing and I will harp on this in a little bit, there isn't such a thing as a platform and in fact, software and technology is now having to operate at the same time on multiple devices so this is another good Steve Jobs example—my colleagues decide that Steve Jobs isn't rich enough and they decide they want to make him richer all the time. My wife—she decided she needed an iPad. Something that didn't exist a year ago. She decided she needed.

[Applause]

So, I'm $753 poorer. And Steve Jobs is $753 richer. He obviously needed the money more than I did. But the concept is that we're developing applications and concepts and software that has to run on multiple devices at different times for different people—in fact at different times for the same person. Look at me. I have three devices all doing something up here. My phone running Android. Firefox here and PowerPoint and Windows stuff on this one.

We've also got a world in which—and this is the world I absolutely come from, the world in which anybody in—any idiot can become a publisher. So, we may look at the healthcare blog in a little bit. Tools like blogger and word press has made it insanely easy to publish. By the way this has blown up and killed the—the reason why I was joking about the New York Times is that this really has blown up and killed the newspaper business and it's also causing a lot of trouble—the good news about coming to a healthcare group and talking about Health 2.0 is that most of this stuff is in their future. If you're talking to a record company you're talking to a newspaper group—sorry guys. It happened. You missed it. It becomes easier to publish, also it's becoming easy to develop. Now at some point I am very good at using word press and blogger and type pad and I can edit, hack away in HTML very badly and make sure the text looks all right. I don't know how to develop. But al lot of people do know how to develop. You guys have a hack a thon last night and it's getting much easier to do interesting things so you've got some ease of development platforms developing out of this. So, Facebook is an obvious one. A friend of mine works for that company Zynga which makes that really irritating game Farmville and if you're on Facebook you have all these people spamming you saying come please and—I don't know—it's amazing, there are millions and millions of people who are fascinated by having virtual sheep. I don't know what that says about us as a society—they want to water their sheep and it's quite interesting that they've ins—Zynga's psychology to insinuate the concept of gaming into the culture and in fact if somebody in healthcare would figure out—we don't get people engaged in their health enough and I'm hoping that some of that will translate—there is some interesting gaming. Twitter is another platform. This is something that we did a Health 2.0 just this last week.

I don't want to say much about the organization, but we are running—I missed your hack a thon because I was having dinner with a bunch of folks from HHS including the CTO who was maybe the richest guy in DC was embarrassed about the fact that he couldn't pay for his colleagues dinner. He did buy me dinner. Apparently that was okay under the government regulations. So last week, this is

just one photo of about 150 people crammed into a small office in Palo Alto. What these guys are doing. They're—this is called hack for health. These guys were taking the government data sets made available by Tom Parker and his colleagues at HHS and basically trying to write code right then and there to take that data set and make it useful either to patients or to health officials or to whomever. There's also a thing called the community health data initiative which was launched in March and has been going on through the summer. The Health 2.0 organization which I cofounded is running something called the Health 2.0 developer challenge. We have eleven challenges out there where all kinds of developers can come and take data sets. Take challenges, take data for example things like the blue button challenge. The Blue Button is a—quick. Blue Button? Anyone heard of it? No one? Show of hands if you've heard of the blue button initiative? Not many of you. So. this is a good point. Blue Button is announced by President Obama not so long ago. The concept is that on the merdicare.gov site and the VA site you're going to be able to go along and hit a button and download all the data they have about you as a patient. So if you're a Medicare patient, or a VA patient, you'll be able to download that data. So now we're making a lot more data available, and that's just one of the eleven challenges up on the Health 2.0 developer challenge site. If you care it's health2challenge.org. The thing is we're seeing a lot of this innovation that happens in the silicon hack a thon, happens in your world coming into healthcare and we're kind of late. And just to say what level of innovation, the hackathon is really fascinating tool by a guy from Twitter. Just to give you a sense. So Twitter, a company mostly you never heard of two years ago, um. Actually—I'm going to check up on you guys here. So—is that Twitter. No. Sorry—where is it. Ah. I hate Explorer. I did pull a Twitter Feed. Let's do a refresh. Oh no. Here we are—Who's tweeted about caBIG® this morning? Somebody did. One person. One person. Twitter the most important new technology in the US and only one of you—Oh. The wrong hash tag. Now you tell me. Let's—okay. So I'm giving you a hard time but possibly wrongly. Hm. That looks a lot better. Okay. I mean minor gentle harassment. Teasing there, so the issue that I'm getting there is twitter has developed into a platform that's quickly enabling people to build all these little applications off the stream off and this is a company which at the moment doesn't seem to have any revenue and make any money but it's on the national psyche very quickly.

All right so I'm going to dive into Health 2.0 and spend most of the rest of my time doing this and if we have any time at the end we'll get to some of the big picture stuff. All right, you guys don't need to be told this but the share of Americans going online increased dramatically in the 2000s and the share of those people who are online looking at healthcare issues stayed pretty constant. I've got some data from Susannah Fox at Pew. I can show you about the answer is this is really increasing and continuing to increase. So, what is Health 2.0. There are a number of different definitions but my favorite is the one that I did, surprise, surprise which is really saying that these social software—these lightweight tools from Web 2.0 have now promoting collaborations between all the stakeholders in healthcare. There are some of us that think Health 2.0 are rather more revolutionary. Looking at transparency and patient value and I'll show you some ways that we might start talking about that and there are others—Ted H. [inaudible] who's in DC working with Kaiser believes that it's all about participatory health care and it's all a society of participatory medicine.

Let me give you the constituent part of the first chunk. There is a progression but here's the first chunk and it's really about these big four pieces. Search and making search making it more help into the long tail. Communities that capture the accumulated knowledge of patients and their caregivers and help explain that a bit. Intelligent tools for content delivery. And then better integration as data with that content and I think really what's happening is all this technologies have been talking about are starting to diffuse and increasingly trying to use that to guide their own care and in some of the cancer communities this is very extreme. I'm not going to focus too much on cancer today because you guys know—hear enough about that stuff already. We're going to look at some of the other ways we can use these tools but in the end what's going on here is the leading edge of patients is globbing onto these sites and we'll talk a bit about some of the numbers ins a second. I used to be a consultant so here's as graphical representation. Search is the big kahuna? Why because those guys in Mountain View figured out how to make some money out of it. Or somebody else figured out how to make some money out of it and they stole the idea.

But nonetheless there's a reason why they have their private 767 leaving from Moffat failed, the air base right next to Google and poor Larry Ellison, the guy who owns Oracle, he has to drive from his business—his house to his business all the way past Google to San Jose airport to go on his Lear Jet. It's just not fair.

[Laughter]

Social networks and tools are the other parts. Social networks, we talked a bit about this the other day and Susan Love's presentation was fantastic, I really enjoyed that. She's basically created a network for a [inaudible] social good, but there's a lot of activity in social networks. There's more than 100,000 groups on Yahoo Health alone. Just think about it, 100,00 groups on Yahoo Health alone. Let alone some of the other things I'm going to show you about and then there's a lot of developing tools in the way—in the—and tools—I'll define it later but it's basically a way that you can use a simple web or mobile or other interface to basically change the way that you're interfacing with the healthcare system. The problem with the delivery system and the healthcare system and this is probably the problem also in research and I don't know much about research is that we've got a lot of transaction data—there's a lot of content out there, not always great, but we haven't figured out how to put those two together and I'm thinking of something underpinning the whole concept of Health 2.0 is can we somehow get those two things together, a healthcare transaction which is usually around a healthcare event and bring content to everybody that's relevant to that event or that situation so that's what I think we're trying to do.

Okay, so I'm going to dive in now and look at some of these—you'll have to bear with me because some of this is some of this—this is stuff I put together because skillfully this morning my little laptop wouldn't work. I'm going to show you a few of these sites just to give you an idea of the amount of data that's being created. This is one of my favorite sites to show—mostly of the joke value. This is daily strength which is one of the original Facebook like comminutes. I don't want to say there weren't healthcare communities online before we got these attach to

profile and put your identify online issues that we have on Facebook, MySpace like social networking that we know now. My friend Jill Freidman who runs ACCOR the cancer listservs is still sending out—there are still a couple of million e-mails a week—a month going out over ACCOR, still tremendous resource in those text based listserv emails. All of us are on multiple listserv's. That's a community—I don't want to belittle that but it's a little hard to collect data out of those issues. Jill is trying to work on—you think about ACCOR in the millions of e-mails over the years—the stuff that's buried in there is fantastic and can you get it out.

Here's a way that using daily strengths that you can actually vote or get information or see what other people are doing and look at these—there are some pretty big numbers here—42,000 people have voted on most popular treatments. I'm particularly keen on this chart because if you look at it, I've always thought—this is a voting on what's effective treatment mostly for depression—crying works 80% of the time whereas Prozac only works 64% of the time.

[Laughter]

All right, let's look a little bit about search. I'm only going to pull up one search. There's a lot of people trying to do search in different ways so obviously a lot of money around it. Just give you one example of health search engine that is trying—I can pull up one cancer site. This is right health. Pretty popular vertical search along with Recruizit drug advertising. What they're doing here is showing you a number of things. Search has got you to treatments, causes, preventions, types and stages. They have genetic information. This comes from a company called access DNA if we go and open that in a new tab, we'll see that you can now go and find out all about their tests about prostate cancer. You can have a health risk guide and you can actually these guys—you can order a test on line and these guys had some issues with—because they're the ones who tried to do an at home genetic test sold at Walgreens, and actually it got them in a bit of trouble with the regulators. Nonetheless, you can go from a search to some very complex tools and pretty quickly but I think what's also interesting is the way they've combined here is you've got both stuff from experts and you have stuff from patient experiences. Here you can go and look at something from these prostate cancer sur—I don't want to go into the details—a lot of information here about people talking and explaining stuff to each other on a health board about prostate cancer. Search now is making it much easier to get into different types of information including user generated content.

So, let me show you a couple of other sites. This one is interesting. This is a site called med help the reason I'm bringing this up—unfortunately I don't have a view into this part of it, the part of it that's most interesting, the communication—med health is an interesting evolution. This one is getting about nine million visits as month. WebMD is in the low 20 million, so it's pretty big. What it is, is a series of message boards and community of people talking to each other so that's talking to each other—it's a separate group within med help basically asking questions of doctors and they have many leading academic medical centers allow you to ask questions of doctors, so you're having a lot of communication between doctors and patients online within these forums and what they've now started to

do is add tools such as trackers, food diaries, mood trackers because they're finding that people who come to this site, get into a community. Getting answers to questions and now they want to track their own information and that's something I'm going to talk to you a little bit more about—

Unfortunately my login died—let's try it one more time and see if it works. No. It doesn't love me. It's a pity. 23 & Me is an interesting site. It's showing what it is just if you're not familiar with it—Navigenics is another which essentially is doing those genetic tests for you and sharing information with you. I was going to show you that I have a low risk of prostate cancer because I've had my self done on it. I'm not sure myself done is the right expression,--

[Laughter]

I've had my genome sequenced by them. Again, some controversy about whether or not their results are exactly accurate and all the rest of it. I don't want to get into that but I do think what you're sharing is that cheaply available tests that were only available—that weren't available fifteen years ago were only available at great expense not so long ago and now very cheap and easily available and you can now go start searching for information in your ancestry and amongst your friend.

Now let me give you a sense of other tools available. Now I'm the non-MD idiot in the room so I hope somebody will correct me here, but this is a cycle double check MD which is doing some pretty interesting stuff. What this site does is it basically allows you to look at the drugs you're on and the symptoms you have and it's going off and pretty close to real time redoing—natural language recognition—[inaudible] the first databanks [inaudible] one of those drug databases with all that information, which no one reads—those long monographs. And it's going to come back and—let's see if I can find—does this sound like I have tingling in the skin—tingling in the lips. Let's try that one. Maybe tingling in—oops. So let's do that. Let's evaluate my drugs and symptoms here. Here's the disclaimer. It will come back and say what's going on. We know somewhere in the region between 10-30% of people showing up to the doctors are having who are on multiple drugs have symptoms which are connected to their drugs. Right, but it's quite hard to figure that out. In some cases they're pretty rare symptoms so you know in this case it's telling you a little bit—it's saying lip tingling with Prozac is pretty rare, but lip tingling with Lipitor is relatively—its' common enough that it comes up—then it says what are my next steps. Okay it tells you what to do next—so I can go off—here's some of the lab tests I can have. Here's some follow-ups I have had with my physician. Here's some side effects that I should be thinking about. So that kind of information would have been very, very hard to get not so long ago and now it's available to virtually anybody—I mean me, a guy who doesn't take—probably should take Lipitor and you may think I should take Prozac, but can go in and look at it straight away so what I'm saying here is we're seeing a fast change where some of the tools that have been available outside of healthcare in the way people are managing their lives and are now coming into healthcare pretty rapidly.

Let's try—I'm going to try and work this out—I should actually show you the—oh no. I hate it when it does that. I—I am going to guess my password. And it may be wrong. I apologize. I was going to show you some fun stuff. This is—ooh. I got it right. This is healthful and I'm going back and what I've been doing recently—this is a change in the way that things are working is I've been actually weighing myself on a wireless scale in my bathroom. It's—the wireless scale itself has recently developed some issues but I can show you that in over time, my weight's gone up and gone down. The Google Health, version, by the way—they just changed Google Health as of nine o'clock this morning. There should be a post in the healthcare blog about that but we might go and see if it's come up yet. Its' a little bit better. You can play around with the date range and that kind of stuff a little more easier. What this is showing is that with no effort. Standing on a scale, I'm now getting information about myself sitting here in this accounting healthful and you're going to see far more of this integration. What happened is the company that makes the scale, Withings, you know did an API matchup with healthful and there are now companies that are doing a middle layer—there's a company called Lazeron which is a prodigal health [inaudible] which is doing a middle layer between the two of these things so that anybody with a tool can plug it into Lazeron and they can basically go and do the middle layer so they can go into any device. You plug into that system once, but what you're seeing now is the change where all these kinds of tools are now easily—I'm going to track—myself—you may remember at Med health there were things you could track yourself and you can do a little bit of self-tracking—I do a thing called tweet what you eat now and again. To try to self-track my food and literally I'm tweeting into the service and saying what I had for lunch and it goes and guesses at calories and stuff. It gives me a little food diary. But in fact, more and more of their stuff are going to come out of their automated devices and more and more of it is going to end up in this data utility lab. So you know I'll show you a bit more about that in a second. So, let me sort of wrap this segment and go back to the rest of the resonation of Health 2.0 and give you a sense of what is coming next.

So showing you these various pieces and this was the consumer front end. There is a lot more stuff appearing for physician and clinicians and researchers, but here's kind of my quick sense about what's coming next. What I've shown you is kind of already here. Suzannah Fox at Pew has some great calls herself a geologist. She's looking at survey data about what's changing and she's published a piece just yesterday on the e-patinets.net blog which basically was talking about the growth of the combination of mobile phones and smart phones and broadband and the more easily accessible internet. What that's done is made it so there's not so much of a digital divide anymore in terms of access to information. So, I think that's kind of historical. What we're going to see now is tool and services that integrate all these three different parts. They're going to be matching up communities tools, search. So my little three ring circus definition that I started three years ago, is pretty much going to be irrelevant pretty soon because you won't be able to tell pretty much whether something is a search tool, a community tool or a tool for you to do stuff because you'll be able to change the way that it works for you on the fly and it's going to go to multiple devices.

Let me say a couple of more things. One is this data utility layer I just showed you healthful. Not fanatically highly used at the moment but confirmation about things

like the blue button download making more data from the healthcare system available. The work that you guys are doing in caBIG® the ability to upload data from various systems up to the new to come website. I don't know when it's coming, Ken but soon we hope. To me that is a very exciting possibility and you're going to see a lot more data around and don't forget, I'll touch on this if I have time right at the end, there's $30 billion from the government—or $34 billion or whatever the number to fund electronic health records and one of the criteria for meaningful use is that the provider organization the physician or whomever has to be able to deliver that data out to the patient upon request. You're also going to see a lot more diversity in data types coming into this system. I showed you—failed to show you because I my password wasn't working—my genomic type and we talked about data from device s coming in so from the wireless scale blood pressure cuffs, anything you can think of. A bunch of this stuff is going to go into Best Buy very soon so they're planning in 500 of their stores—Best Buy is planning on putting in a whole segment which is going to sell health tools, wireless scales and blood pressure cuffs and what have you so a lot more data is going to be coming in from the home—there's even a company called my trust who's we're going to be featuring at Health 2.0 next month which is going to be—she's actually running clinical trials at home over the internet using these kind of tools.

And then there's this concept which I've wanted to introduce around platforms. So here's my concept around platforms of various different types. Lots of different platforms that we call [inaudible] I wear the ones [inaudible] on stage—I have worn a dress at a healthy [inaudible] conference before, but—but here's the concept—and you don't want to dive into this—I've written a report that you can dive into on Health 2.0 but the idea is we're now seeing a number of different ways both for applications that are different changes where applications on the same device and we're not in the same flow. So just to give you some quick examples of what we're talking about here, this is pretty obvious, the same type of tool. This is the carrot.com, the tracking thing. You can use it on the web. You can use it on your iPhone. The thing on the right is fascinating. This is a short code sorry this is an SMS code and you probably can tell that there is a Morse code type thing buried in this. This is used in rural villages in Africa in Kenya, the millennium village's problem, problem—it is a problem—the millennium village's project—it's Matt Burgh at Columbia and what he's done is basically created a way where a health worker and they've got no roads. They've got nothing, but they've got cell phones. Right. A health worker can measure a child figure out they're at risk for malnutrition by putting in codes, send it back to a central server, the server will figure it out and send an SMS code back basically telling them what to do, all done in 160 characters or less, using it essentially like a modern day Morse code.

Really amazing stuff being done. A colleague of ours, James Matthews who works in India and elsewhere says Health 2.0 is about doing great things with simple tools and that's a great thing. So that's the kind of things we're showing. Different devices. Technology of different devices. Lots of different channels by the way different things on the same device and the channel for Health 2.0 applications is really increasing. I'm just going to pick two of these—the one on the bottom left, vitality—we're talking about billionaires—Patrick Soon-Shiong has

got some investment in this company. It's an internet enabled pill box that flashes at you, rings your phone, does whatever if you didn't take your drug. So think about ways—that's—your internet—it's your phone. Now it's your pill box. So. you've got to think about the ways things are changing. Point that out another five years and think what else—we used to joke about surfing the fridge but we may be surfing the fridge. Right? A company like Eliza. I don't know if you're familiar with this. They're a company which has a number of different options. They basically do automated phone calls but they now are sort of figuring out—they have changed their business such—they know a lot about the people they're calling and what they're doing is going back and forth between automated phone calls, e-mails and web sites—they're trying to figure out what's the right way using what channel to touch the right person at the right time to try to get them to change their behavior. So you're seeing a lot of this distinction around different channels. You're seeing applications which are now sharing the same platform. For example on the left hand side we have one called i-triage. It's on an iPhone and you click on a particle one of these buttons and it will take you off either maybe use another service to call a doctor or take you to some other information. So sharing that. We even have different data going back and forth between different platforms. So here's a company. A tracking company called polka which has built into its iPhone application a pain map from a company called relief in sight and when you click on the application within polka, you click on the pain net within polka, you head back to you actually put that information back in the release in site. So in other words, all this matchup is going to continue and I think it's going to start reaching providers. This is a quick screen shot of a company called American well which is one of a number of companies—but these guys are well down the path are actually starting to deliver online care information.

This is a quick screen shot of a company called American well which is one of a number of companies—but these guys are well down the path are actually starting to deliver online care with better information during this online visit for you and the physician because they're getting it from the other sources, probably than the other physician has in their face to face visit. So, I think you'll see the location of how care changes dramatically using these relatively simple tools. This is basically Skype. With a bit of security built in.

Kaiser Permanente which has gone basically to e-mail—secure e-mail in their system has now got sixty percent of the number of visits primary care doctor visits that it had before it put in this health connect system. Think about the change in that. Sixty percent—total forty percent fewer visits because people go online. Using their tools and steps.

So here's kind of an—and I'll end this part and if we have three minutes I'll rush through some big picture stuff and maybe we will get to alpha form after that. Here's kind of where I think this is going. And we're really the fist—we're starting off with user generated healthcare, user generated content. I think that's done. We don't have a lot of tool use yet, the tracking, but that's coming and we don't have a lot of Usenet tools to connect with providers. But again that's coming and I think that's coming pretty quickly. We're starting to see some of these tools start to change the way care is organized and delivered and very limited amount we're starting to see some of these sites and patients [inaudible] was mentioned

mentioned—can I find it—of course I can't. Too many pieces. I apologize—patients like me—if you haven't seen it. Go take a look at patients like me. Because what it's doing is basically allowing people to share information with each other and go and track down other patients who are like them but it's also allowing a real time view into all that activity online and with people with rare diseases, really fascinating stuff. Okay. So, I'm coming to the end of my time—do I have two minutes to [inaudible] the universe and everything or not. Two minutes. Alright. Let's quickly do this. I used to be a pollster by the way—people talk about predicting the future and Americans believe pollsters, we got beaten out by Vershay Rodie but we do beat out the magic eight ball.

When was America great? 1968. When they made the Camaro. 1967-1969. I used to have a 1969 Camaro—some bastard stole it, but anyway. What was the greatest thing about the Camaro? Raw power. Great. There were some issues with it. You couldn't turn corners. Much. Does eight miles to the gallon. What are they all doing now? Do you know what this is? This is the dashboard for the Toyota Prius. By the way my car—I tried to get a jump start from my neighbor—he had a Toyota Prius. You can't jumpstart from a Prius. What's this telling you? Now no one gave a rat's ass about fuel consumption back in 1968. Now we really care about the stuff and we're now really interested. What is this today? We're making something we didn't know about using fairly simple tools visible. So you get forty nine miles to the gallon in your Prius. Okay. It's a big, big change. We have big issues in all these things that we know about energy and elsewhere and the same sort of thing comes into healthcare.

The other thing we have going is we have a massive consumer society. This is a picture taken on black Friday. That shopping day after thanksgiving in Long Island a couple of years back. This was the crowd assembled outside trying to buy a color TV. Somebody actually died in the trample to get to the onscreen—flat—on sale flat screen TV. Literally. We're that much of a consumer society. But here's the big picture issue. And this is where the healthcare redistricting issue comes is we also have a lot of social insurance. We don't do it very well in America, but part of the issue has been that we can't afford our healthcare system. Partly because of the way we've been delivering products to market. I hate to say this to you guys, but the world of treating cancer now is we're spending hundreds of thousands of dollars on new drugs that extend life by a very small amount. It's a big societal problem, but if we're going to cover everybody we have to thin about this issue of whether we continue to do that. This is—back to the thirties when we had the depression and that's where social security came from and that's not an accident that we've now finally got to a got to a healthcare reform bill in the aftermath of the next worse big depression—recession after the thirties.

I already talked a bit about Facebook and that and but the other thing—we're all easily on with technology all the time. Facebook is great. We can all spend a lot of time playing with our sheep and all the rest of it, but there is an issue that technology is a bit more of our master as well. And you know this is a Charlie Chaplin excerpt from *Modern Times*, but those of you who remember the movie or may have seen it is that basically he gets trapped in the machine.

So why healthcare and why now? I'm actually going to skip to the end of some of this stuff and just to show you—well, maybe I'll show you this one slide. Pretty obvious here. We spend a lot more money on healthcare and we don't cover everybody and I won't—I won't go through these one by one at a time, but it ends up that we have a pretty big problem. This is our core problem in healthcare and something we have to figure out and I think this are some moves in the reform act to do this. Okay. So this is a very simple—those of you who do economics. Most of you guys are techies so you probably don't do that, but those of us who did economics back in the day know that if you pay more for something it should be better. So, here's some data from the Dartmouth Group which basically shows that the line goes the long way. This is quality of Medicare—state rankings in Medicare spending it goes the wrong way—the outlier there is Louisiana. Which spends the most on Medicare and has the lowest quality. This is a big problem that we have to fix, right so we're going to do it—that maybe where we're heading. Right.

[Laughter]

I want to show it to you—but you don't need to known but there's a lot of slow uptake in electronic medical records and it's very hard for patients to get their information. This is Regina Holliday. Messing around on my Facebook page there. This is her husband Fred's file. If you haven't been there's a great mural on a gas station up at Politics and Prose on the street from here called seventy three cents—the reason it's called seventy three cents is it's about a husband's stay in the hospital—that's how much the hospital wanted per page to copy this record. So data liquidity and accessibility is a real problem, but I think we're getting to that. We can do EMR's. The best way to do that is you move the country—you change your country's name to begin with N. And we're looking for one of these. Right. Skip past this stuff quickly. We passed the healthcare reform act. It was a bit like this for the healthcare system. This is part of Regina's mural. Just skipping past. Let me just end with this thought for you. There was a lot in the healthcare reform about legislation. It was a big piece of legislation and there was a lot of regulation to follow it up. The legislation was mostly about covering people. It was about getting people—and figuring out—whether a political deal had to be figured out in order to get people into the system. The insurance system. The Canadian's said—everyone in the tea party thinks it's a massive expansion of government control. The CBC when they interviewed on the Canadian broadcasting system, when they interview there. They're representative body. The US has just passed a massive expansion of private health insurance. He's actually right. It is a massive expansion of private health insurance. It's also a big expansion of Medicaid. But that—once we get over the point of figuring how we're going to cover people, hidden in the bill is a bunch of interesting stuff about regulation. And a load of the regulations are on how we're going to pay for stuff in Medicare and I wanted to say three things that you've got to pay attention not which I think will loopback to all the stuff about Health 2.0. The first one is that there is a new center for innovation within Medicare and Medicare is going to be spending about ten billion over ten years trying to figure out what works and what doesn't. The second part relative to that is if they figure out what works and what doesn't the secretary can at her or his discretion turn

that into a program for the whole of the Medicare program. Doesn't have to go back to Congress. So Medicare now has the potential to change what it pays for. And I think that may well reflect back on a lot of the stuff I talked about.

The third piece which I think is very interesting is there's something called an accountable care organization—I don't have time to play a fun little video but there's a fun video on my blog you can see about you know what is an accountable care organization. I promise you that almost nobody in the health care system has a clue. It sounds a bit like an old world HMO Kaiser-type of organization. But the idea is here that and it's going to be coming into law in 2012 is that accountable care organizations can set up and sort of take risk for a population and that will change the way that we think about delivering healthcare to those populations. Now this is all early stage stuff but if we go from a fee for service transaction base system to one that's more about one that's more about thinking about the overall health for the population, a lot of those tools a lot of those communities, a lot of those things that I was showing you [inaudible] a lot of the communication between doctors and patients becomes much more viable and much more sensible and we're getting to a market sort of getting to a market where you can suggest that the types of innovation we're seeing in research we're seeing in your world and we're seeing in the technology world and we're seeing in business will start coming into healthcare much faster. So I'll close there. I'm glad that nobody got up and threw anything—I'm getting the times up thing. I'm taking a bit more of my time than I should be and I apologize. And thank you for your patience. I'll close there and just close with the thought that all the stuff I've been talking to you about has big implications if it becomes a bigger deal, search is there. People are searching online. Communities are getting there. But all those tools and tracking producing data is going to come back into your world when it becomes a bigger deal and the healthcare system now is just perhaps starting to show the changes and label that to happen and I hope that while you're doing your research and all your great work, you just keep out of the corner of your eye you pay a little bit of attention not that. And with that I'll thank you for your attention and stop there because I've run over time. Thank you.

Speaker:

- **Matthew Holt, M.A., M.S.**
  Health 2.0 LLC